

## WHAT IS CLAIMED IS:

*sub A4*

1. A data transfer apparatus transferring data from a  
2 data source to a data destination comprising:  
3 a first-in-first-out buffer memory having an input  
4 connected to the data source, an output connected to said data  
5 destination and a predetermined number of data entries;  
6 a master queue counter storing a master count indicative  
7 of a number of data entries available for data storage within  
8 said first-in-first-out buffer memory, said master queue  
9 counter connected to the data source to decrement said master  
10 count upon allocation of data at said data source to be stored  
11 in said first-in-first-out buffer memory;  
12 a remote queue counter storing a remote count indicative  
13 of a number of data entries within said first-in-first-out  
14 buffer memory currently storing data, /said remote queue  
15 counter connected to said data source for incrementing said  
16 remote count upon allocation of data at said data source to be  
17 stored in said first-in-first-out buffer memory, connected to  
18 said data destination for decrementing said remote count and  
19 generating a decrement confirmation signal upon transfer of  
20 data out of said first-in-first-out buffer memory to said data  
21 destination; and  
22 wherein said master queue counter is further connected to  
23 said remote queue counter for incrementing said master count  
24 upon receipt of said decrement confirmation signal.

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1       2. The data transfer apparatus of claim 1, wherein:  
2        said master queue counter is initialized to said  
3 predetermined number of data entries of said first-in-first-  
4 out buffer memory; and  
5        said remote queue counter is initialized at zero.

1       3. The data transfer apparatus of claim 1, wherein:  
2        said data source may allocate data to said first-in-  
3 first-out buffer memory only if said master queue counter  
4 indicates a non-zero number of data entries available for data  
5 storage within said first-in-first-out buffer memory; and  
6        said data destination reads said first-in-first-out  
7 buffer memory only if said remote queue counter is non-zero.

1       4. The data transfer apparatus of claim 1, wherein:  
2        said data source may selectively annul allocation of data  
3 of said data source to be stored in said first-in-first-out  
4 buffer memory, said data source generating an annul increment  
5 signal upon annulling data; and  
6        said master queue is further connected to said data  
7 source to increment said master count upon receipt of said  
8 annul increment signal.

1       5. A method of transferring data from a data source to  
2 a data destination comprising the steps of:  
3        maintaining a master count indicative of a number of data  
4 entries available for data storage within a first-in-first-out  
5 buffer memory;  
6        allocating data from the data source to the first-in-  
7 first-out buffer memory only when the master count is non-  
8 zero;

9           decrementing the master count upon allocation of data at  
10          the data source to be stored in the first-in-first-out buffer  
11          memory;

12          maintaining a remote count indicative of a number of data  
13          entries within the first-in-first-out buffer memory currently  
14          storing data;

15          incrementing the remote count upon allocation of data at  
16          said data source to be stored in said first-in-first-out  
17          buffer memory;

18          transferring data from the first-in-first-out buffer  
19          memory to the data destination only if the remote count is  
20          non-zero;

21          decrementing the remote count upon transfer of data out  
22          of the first-in-first-out buffer memory to the data  
23          destination;

24          incrementing the master count upon confirmation of  
25          decrementing of the remote count.

1          6. The method of transferring data of claim 5, further  
2          comprising the steps of:

3            initializing the master count to the number of data  
4          entries of the first-in-first-out buffer memory; and  
5            initializing the remote queue counter to zero.

1          7. The method of transferring data of claim 5, wherein:  
2            selectively annulling allocation of data of the data  
3          source to be stored in the first-in-first-out buffer memory;  
4          and  
5            incrementing the master count upon annulling allocation  
6          of data.